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This work by Dr. FISCHER, for which he has been preparing for more than a dozen years, is replete with new matter of great value and is altogether admirable. —J. C. ARTHUR.

MINOR NOTICES.

THE FOSSIL FRUITS from the lignites of Brandon, Vermont, are the subject of an important contribution by PERKINS.[2] In 1861 LESQUEREUX described twenty-one species from this locality, which he regarded as of approximately the same age as the Œningen stage of the Swiss Miocene. In 1902 KNOWLTON published a brief paper of forms from this locality which represents all we knew of this interesting flora up to the time of publication of the present paper. The deposits have been much obscured and inaccessible for a half century, until the coal famine of 1902, when the lignite came into demand locally as a substitute for coal. The state geologist, GEORGE H. PERKINS, was enabled to secure a magnificent collection of the fossil fruits during the mining operations, and the present paper contains the result of preliminary study of these collections. One hundred and eighteen species are recorded, and many new forms of more or less doubtful botanical affinities are described. These are largely included in the following new genera: *Monocarpellites* (11 spp.), *Hicoroides* (5), *Bicarpellites* (5), *Brandonia*, *Rubioides*, *Sapindoides* (6), and *Prunoides*. The illustrations consist chiefly of photographs of type specimens, which are perhaps less satisfactory in showing details than careful drawings. The flora is unique in the abundance and variety of its fruits, and it is to be hoped that future study by Dr. PERKINS will demonstrate with more precision the exact age of the formation containing them. The accompanying clays should be searched for leaf remains.—EDWARD W. BERRY.

POPULAR ACCOUNTS of soil inoculation for legumes devised by MOORE have attracted wide attention, so that it is of special interest to receive his own account.[3] The nitrogen is fixed by the tubercle-forming bacteria within their bodies. This was determined by cultures in flasks containing nutrient solutions without nitrogen. There was no increase of nitrogen in the solution, but a marked increase in the organisms themselves. In its biology the organism is therefore considered a parasite. Later the plant is able to overcome the parasite and profit by the nitrogen which has been fixed. When grown on nitrogenous media, it was found that the organism lost both its power of infecting leguminous plants and its power of fixing nitrogen. In non-nitrogenous media both of these properties were retained. The failure of NOBBES'S attempts in Germany a few years ago to put upon the market pure cultures of this organism can probably be attributed to lack of recognition of this fact. As a result of these studies MOORE has devised a method of putting up for distribution pure cultures of *Pseudomonas radicicola*, grown in nitrogen-free media and dried on cotton immersed in the culture. These cultures are sent out by the U. S. Department of Agriculture together with packages of nutrient salts to multiply the organism. The mass-culture thus obtained is used to inoculate the seed or the soil. Numerous reports from farmers of all states indicate that this method will prove successful and practicable.—H. HASSELBRING.

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[2] PERKINS, GEO. H., Description of species found in the Tertiary Lignite of Brandon, Vermont. Rept. State Geologist, Vt. 1903–1904. pp. 174–212. *pls. 75–81.* 1904.

[3] MOORE, G. T., Soil inoculation for legumes, etc. U. S. Dept. of Agric., Bureau of Pl. Industry, Bull. 71, pp. 72. *pls. 10.* 1905.

THE OFFICE of Experiment Stations of the U. S. Department of Agriculture has recently issued a valuable syllabus[4] of the diseases of the Irish potato in the United States by STEWART and EUSTACE of the New York (Geneva) Experiment Station. This is the second of a new series of publications designed primarily to assist farmers' institute lecturers in the presentation of various important subjects to farmers. Each lecture is accompanied by a set of lantern slides, there being in this case forty-seven slides in the set. Arrangements have been made to loan these slides to lecturers, or they may be purchased through the Department of Agriculture at a very moderate cost. Both the syllabus and the accompanying set of slides should prove of great value to teachers of plant pathology in presenting the diseases of the potato. A brief bibliography is appended to the syllabus, which contains references to the most important American literature of this subject.—E. MEAD WILLCOX.

AN UNDATED EDITION of ANDREWS'S *Botany all the year round* has been issued, which differs from the preceding one[5] only in being bound into one volume with a flora by W. NEVIN GEDDES.[6] This flora brings together compact and simple descriptions of the more common flowering plants, not only native and naturalized, but also cultivated, and includes about 1,250 species. The sequence of families is an interesting reminiscence of the old time classification, and it is quite a pleasure to see gymnosperms once more as a subclass of "Exogens or Dicotyledons." The nomenclature, too, is frankly "conservative and eclectic;" but the book does as well as any other to enable a student to find names for plants, which seems to be regarded as a very valuable exercise.—J. M. C.

THE FOURTH PART of SARGENT'S *Trees and shrubs*[7] contains plates and descriptive text of species of Acer (13), Parthenocissus (3), Malus, Oroxylum, Phellodendron (3), Arctostaphylos (2), Dracaena, and Pinus (2). There are two new Chinese maples, a conspectus of the maples of eastern continental Asia, two new American species of Parthenocissus, and one new Chinese Oroxylum, by ALFRED REHDER; a new Phellodendron, by CHARLES S. SARGENT; two new Californian species of Arctostaphylos, by ALICE EASTWOOD; a new Central American Dracaena, by JOHN DONNELL-SMITH; and two new Mexican pines by G. R. SHAW. This part closes the first volume, and contains the title-page, index, and corrections.—J. M. C.

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[4] STEWART, F. C. and EUSTACE, H. J., Syllabus of illustrated lecture on potato diseases and their treatment. Office of Exp. Stat. U. S. Dept. Agr. Farmers' Inst. Lecture **2**:1–30. 1904.

[5] See BOT. GAZETTE **35**:439. 1903.

[6] GEDDES, W. NEVIN, A brief flora of the eastern United States. New York, Cincinnati, Chicago: American Book Company, with no date.

[7] SARGENT, C. S., Trees and shrubs. Illustrations of new or little known ligneous plants, prepared chiefly from material at the Arnold Arboretum of Harvard University. Part IV. pp. 151–217. *pls. 76–100.* Boston and New York: Houghton, Mifflin & Company. 1905. $5.00.

HERBERT STONE[8] has brought together a most interesting collection of descriptions and excellent photomicrographs of commercial timbers. Being able to draw upon the British colonies for material, the list is unusually full. An introductory chapter gives a general account of the varying structure of wood from the standpoint of one who has a practical acquaintance with timber; and this is followed by practical hints as to its identification. The list of timbers includes 247 numbers, each species with a very full description, all the genera being illustrated by photomicrographs.—J. M. C.

THREE PARTS of an illustrated handbook of the angiospermous woody plants native or hardy in middle Europe by C. K. SCHNEIDER have appeared.[9] The illustrations are numerous and excellent, floral dissections, fruits, and leaves being given, and in many cases fine half tones of characteristic bark. The ENGLER and PRANTL sequence is used. The first part includes Salicacae to Fagaceae, with 95 illustrations; the second part, Fagaceae (Quercus) to Berberidaceae, with 102 illustrations; the third part, Berberidaceae to Spiraceae, with 90 illustrations.—J. M. C.

A SECOND EDITION of GROUT'S *Mosses with a hand lens* has been published,[10] including the common liverworts. The review of the first edition[11] stated the general scope and purpose of the book. The demand for a new edition has justified the undertaking, and with the addition of much new material the author believes that he has reached the limit of the hand lens. The addition of the common liverworts represents a very natural extension of the author's method, and introduces beginners to a group they must have encountered repeatedly in collecting mosses.—J. M. C.

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[8] STONE, HERBERT, The timbers of commerce and their identification. Illustrated with 186 photomicrographs by Arthur Deane. Imp. 8vo. pp. xxxviii+311. London: William Rider & Son. 1904.

[9] SCHNEIDER, CAMILLO KARL, Illustriertes Handbuch der Laubholzkunde. Charakteristik der in Mitteleuropa heimischen und im Freien angepflanzten angiospermem Geholz-Arten und Formen mit Ausschluss der Bambuseen und Kakteen. Jena: Gustav Fischer. 1904. Each part *M*4.

[10] GROUT, A. J., Mosses with a hand lens. A non-technical handbook of the more common and more easily recognized mosses of the northeastern United States. Illustrated by MARY V. THAYER. Second edition, revised, enlarged, and including the hepatics. 8vo. pp. xvi+208. *pls. 39. figs. 118.* New York: The Author, 360 Lenox Road, Flatbush. 1905.

[11] BOT. GAZETTE **31**:132. 1900.

NUMBERS 221 and 222 of ENGLER and PRANTL'S *Pflanzenfamilien* have appeared, the former containing a continuation of the lichens by A. ZAHLBRUCKNER, the latter a continuation of the mosses by V. F. BROTHERUS.—J. M. C.

THE SEVENTH FASCICLE of DALLA TORRE and HARMS'S *Genera Siphonogamarum*[12] has just appeared, including genera from Acanthaceae (7938. Echinacanthus) to Compositae (9371. Liabum).—J. M. C.

NOTES FOR STUDENTS.

PALEOBOTANICAL NOTES.—BRABENEC[13] records thirteen species of plants from a new locality, Holedeč, in the Saaz basin of northern Bohemia, describing new species in Carya, Acacia, Paliurus, and Porana.—BERRY[14] describes additional material from the Cretaceous near Cliffwood, N. J., consisting of rather fragmentary remains of nine additions to that flora, making the total number of known forms ninety-five.—The same author describes[15] a new palm, represented by abundant but fragmentary remains of leaves, from the mid-Cretaceous of the coastal plain in Delaware and Maryland.—In notes on Tertiary plants PENHALLOW[16] describes wood of Taxodium and Thuja from the basal Eocene of Alberta, and of Cupressoxylon from the Cretaceous of Assiniboia. Wood of *Pseudotsuga Douglasii* is identified from near Bozeman, Montana, and the characteristic Pleistocene *Larix americana* (*Larix laricina*) is identified from Georgia. The latter find is most interesting, showing as it does that the larch had pushed about 480 miles farther south than its present southern limit during the Scarborough period of the Glacial. Wood of *Pinus rigida* is recorded from the Pleistocene of New York; and *Juniperus californica* and *Pseudotsuga macrocarpa* are recorded from the Pleistocene at Orleans, Humboldt county, California. The paper concludes with an enumeration of a number of species, based on leaves and wood, from the well-known Don River Pleistocene of Canada.—WHITE[17] has a paper on "Fossil plants of the group Cycadofilices," in which the chief points of interest in this most interesting group are enumerated. He concludes, with WILLIAMSON, that secondary wood originated, polyphyletically and polychronously, as an engineering feature. It is suggested that the heterosporous filicean ancestors of the group Pteridospermae will be found in the lowest Carboniferous if not in the Upper Devonian. Should the author's *Kalymma grandis* prove to

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[12] DALLA TORRE, C. G. DE, and HARMS, H., Genera Siphonogamarum ad systema Englerianum conscripta. Fasc. 7. pp. 481–560. Leipzig: Wilhelm Engelmann. 1905. *M*6.

[13] BRABENEC, F., Ueber einen neuen fundort v. Tertiären Pfl., etc. v. Saazer Schichten Bull. Inter. Acad. Sci. Bohême, 1904. pp. 8 *pl. 1.*

[14] BERRY, E. W., Bull. Torr. Bot. Club **32**:43–48. *pls. 1–2.* 1905.

[15] BERRY, E. W., Torreya **5**:30–33. *figs. 2.* 1905.

[16] PENHALLOW, D. P., Trans. Roy. Soc. Can. II. **10**:57–76. 1904.

[17] WHITE, DAVID, U. S. Geol. Surv. Professional Paper No. 35: pp. 35–84. *pls. 2–6.* 1905.